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# PATENT SPECIFICATION

NO DRAWINGS

1,194,902

1,194,902



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Index at Acceptance:—C3 R (22C4, 22C14B, 22C29, 22C33B, 22D1B1, 22D2AX, 22T2); A5 B774.

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## COMPLETE SPECIFICATION

### A Cosmetic Preparation

We, YARDLEY & COMPANY LIMITED, a British Company of London, England, do hereby declare the invention, for which we pray that a patent may be granted us, and the method by which it is to be performed, to be particularly described in and by the following statement:

The invention concerns polyamides and more particularly concerns a chemically modified polyamide product used in a hair grooming composition.

In our British Patent No. 1,117,129 we disclosed and claimed hair grooming compositions incorporating a polyamide material and prepared by melting and other purely physical procedures. However, in some of the compositions, we encountered a graininess due to a certain measure of incompatibility of the polyamide in gel solutions of the cosmetic vehicles used.

To remedy this we have reacted polyamide resins with cosmetically acceptable organic acids, esters and amides, such as, castor oil, liquid lanolin, fatty acids and alkanamides under specific conditions of time and temperature.

The mechanism of the reaction is thought to involve acyl interchange, the acyl group derived from the ester, amide or acid and which is generated at high temperatures breaking one of the polyamide linkages and becoming associated with the amine portion as a terminal amide of the now shortened chain. Where an ester is used, the alcohol moiety thereof becomes associated as a terminal ester group with the acid end of the shortened polyamide chain and where an amide is used, the amine portion thereof likewise reacts with the acid end. In the case of an acid, no further reaction occurs at the acid end of the shortened polymer.

Thus, according to the present invention, there is provided a polyamide resin when used in a hair grooming composition said

resin being derived from a poly carboxylic acid and an alkylene polyamine, which resin has been modified by reaction with a substantially equal quantity by weight of a cosmetically acceptable organic acid, ester or amide at a temperature of  $300^{\circ}\text{C} \pm 11^{\circ}\text{C}$  for from 1 to  $2\frac{1}{2}$  hours in an inert atmosphere, said acid, ester or amide having a boiling point sufficiently high for them not to be lost from the reaction mixture at the reaction temperature.

As mentioned previously castor oil, liquid lanolin, fatty acids and alkanamides are particularly useful as the reagent.

Preferably, the molecular weight, prior to modification, of the polyamide material is from 2,000 to 15,000.

The invention includes hair grooming compositions comprising the modified polyamide material and a cosmetically acceptable oily vehicle.

Other ingredients, such as scents and colouring agents may also be included in the hair grooming composition as desired.

By using a polyamide material modified as above with cosmetically acceptable reagents the resulting hair compositions are free from graininess and produce clear firm gels of considerable cosmetic elegance.

The invention will be further apparent from the following examples which concern the modification of polyamide resins and the preparation of hair grooming compositions incorporating the modified product.

#### Example No. 1

Equal parts by weight of the liquid fraction of lanolin (a commercially available item) and Versamid (registered Trade Mark) 900 resin (properties of which are set forth in our British Patent No. 1,117,129) were heated together at  $300^{\circ}\text{C}$  ( $570^{\circ}\text{F}$ ) and held at this temperature under an inert gas atmosphere with mechanical agitation for about one hour, after which  $\frac{1}{3}$  of the reac-

[Price 5s. 0d.]

tion mixture was drawn off. The remainder of the batch was allowed to further react at 300°C for an added hour.

- 5 (a) Eight parts by weight of the first of these chemically modified polyamides was combined with 92 parts by weight of castor oil at 200°C for a few minutes until dissolved. The resulting clear solution was allowed to cool at room temperature, producing a clear plastic mass suitable for dispensing as a hair groom from either a jar or a tube. When used as a hair dressing, the hair was left in a shiny, manageable, well-groomed condition with none of the objectionable characteristics of petroleum jelly.
- 10 (b) Eight parts by weight of the two-hour reaction product was combined with 92 parts by weight of castor oil and similar results were obtained, but the mass was softer than in (a).
- 15 (c) Eight parts by weight of the two-hour product was combined with 92 parts by weight of additional liquid lanolin. In all other respects this sample was treated by the same method shown in (a). The resultant solid composition produced was a clear emollient hair treatment product.

*Example No. 2*

- 30 Equal parts by weight of castor oil and Versalon (registered Trade Mark) XR—1165 (a commercially available product) were heated together at 270°C for about one hour and held at this temperature under an inert gas atmosphere with mechanical agitation for about one hour, after which the heat was removed and the reaction mixture was allowed to cool at room temperature. A clear mass resulted which was considerably more flexible than the starting polyamide resin.

Twenty five parts by weight of this mass was combined with 75 parts by weight of additional castor oil by warming to about 200°C for a few minutes until solution was effected. The resulting clear solution was allowed to cool at room temperature, producing a clear plastic mass suitable for use as a hair groom, with none of the brittleness sometimes associated with simply physical solution of an equivalent quantity of resin in equivalent quantity of castor oil.

Favourable conditions for the reaction consist of reacting essentially equal parts of the ester or amide and polyamide at tem-

peratures of 572°F ± 20°F (300°C ± 11°C) for from 1 to 2½ hours with agitation under an inert gas blanket.

It will be appreciated that polyamide materials other than Versamide 900 resin and Versalon XR—1165 resin may be modified, by the above process and used in hair grooming compositions.

Also, it will be appreciated that in preparing the hair grooming composition, a cosmetically acceptable oily vehicle other than castor oil or lanolin may be used.

**WHAT WE CLAIM IS:—**

1. A polyamide resin, when used in a hair grooming composition, said resin being derived from a polycarboxylic acid and an alkylene polyamine, which resin has been modified by reaction with a substantially equal quantity by weight of a cosmetically acceptable organic acid, ester or amide at a temperature of 300°C ± 11°C for from 1 to 2½ hours in an inert atmosphere, said acid, ester or amide having a sufficiently high boiling point not to be lost from the reaction mixture at the reaction temperature.

2. A polyamide resin according to claim 1 which has been modified by reaction with castor oil, liquid lanolin, a fatty acid or an alkanoamide.

3. A polyamide resin according to claim 1 or claim 2 wherein the molecular weight of said resin prior to modification is in the range of from 2,000 to 15,000.

4. A polyamide resin according to claim 1 substantially as hereinbefore described with reference to example 1 or example 2.

5. A hair grooming composition containing a modified polyamide resin according to any one of the preceding claims.

6. A hair grooming composition, according to claim 5 comprising a cosmetically acceptable oily vehicle.

7. A hair grooming composition according to claim 5 or claim 6 comprising a scent and/or colouring agent.

8. A hair grooming composition according to claim 5 and substantially as hereinbefore described with reference to example 1 or example 2.

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